UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/400,755	09/22/1999	STEVEN J. HARRINGTON	XER-2-0277	3771

7590   10/03/2003

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EXAMINER
DASTOURI, MEHRDAD

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08 August 2003</u> .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-17</u> is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-17</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)   4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .   6) ☐ Other: .

DETAILED ACTION

Continued Prosecution Application

1.	The request filed on August 8, 2003, for a Continued Prosecution Application

(CPA) under 37 CFR 1.53(d) based on parent Application No. 09/400,755 is acceptable

and a CPA has been established. An action on the CPA follows.

Response to Amendment

2.	Applicant's amendment filed July 11,2003, has been entered and made of

record.

3.	Applicant's arguments have been fully considered but they are moot in view of

new grounds of rejection.

Claim Objections

4.	Claims 1-7 are objected to because of the followings:

Regarding Claim 1, the phrase "such as" renders the claim indefinite because it

is unclear whether the limitations following the phrase are part of the claimed invention.

See MPEP § 2173.05(d). Claims 2-7 depend on Claim 1.

Claim Rejections - 35 USC § 102

5.	The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed

before November 29, 2000. Therefore, the prior art date of the reference is determined under 35
U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6.   Claims 1-7, 13, 14 and 16 are under 35 U.S.C. 102(e) as being anticipated by

Kuzunuki et al (U.S. 6,266,057).

Regarding Claim 1, Kuzunuki et al disclose a method of verifying a projected

image within a three-dimensional view plane of an augmented-reality display system as

a preselected movable real object (Column 2, Lines 31-40), whereby the object may be

employed as an interface tool for the system, comprising steps of:

identifying a representative characteristics of the movable real object within the

three-dimensional view plane wherein the representative characteristics comprises

shape and location of the object and is exclusive of registration marks and printed

identifiers (Figures 3-14; Column 7, Line 46 through Column 10, Line 26, in particular,

Column 8, Lines 15-31. The actual movable objects illustrated in Figure 3A will be

identified by their center, corner and end points as explained in Column 9, Lines 9-25.

The real (actual) objects do not contain registration marks and printed identifiers for

identification purpose.);

determining dimensional aspects of the movable object from the projected image

(Figures 7B and 8B; Column 9, Lines 9-25);

computing a corresponding dimensional identity and location of the object at an

object point relative to the view plane (Figure 3A; Column 6, Lines 23-32; Column 6,

Lines 44-67; Column 8, Lines 1-31); and

verifying whether the dimensional identity and location are reasonably consistent with predetermined standards for the object (Figure 3A; Column 6, Lines 23-32; Column 6, Lines 44-67; Column 8, Lines 1-31; Column 9, Lines 25).

Regarding Claim 2, Kuzunuki et al disclose the method as claimed in Claim 1 wherein the preselected object comprises a reference panel as a screen, tablet or piece of paper (Figure 3A, File abc, Memo (g)), and identifying includes recognizing a corner of the panel (Figures 1, 3A and 3B; Column 7, Lines 58-67, Column 8, Lines 1-31; Column 9, Lines 9-25).

Regarding Claim 3, Kuzunuki et al further disclose the method as claimed in Claim 2 wherein the dimensional aspects of the object is determined by calculating distances between corners and a center point of the reference panel (Figures 9-14 and 19; Column 6, Lines 23-32; Column 6, Lines 50-67; Column 9, Lines 20-25; Column 11, Lines 23-35; Column 15, Lines 30-67, Column 20, Lines 1-20. Dimensional aspects (actual objects attributes) are calculated based on the coordinate system in coordinate input unit TB. The origin of the coordinate system can be any arbitrary point including the center of the reference panel 101.).

Regarding Claim 4, Kuzunuki et al further disclose the method as claimed in Claim 3 wherein the computing comprises converting the calculated distances to the dimensional identity and location based on an assumption that the reference panel is structurally flat (Figures 9-19; Column 6, Lines 23-32; Column 6, Lines 50-67; Column 9, Lines 20-25; Column 11, Lines 23-35; Column 15, Lines 30-67, Column 20, Lines 1-

20. Computing is based assuming the reference panel as structurally flat pages of a book.).

Regarding Claim 5, Kuzunuki et al further disclose the method as claimed in Claim 1 wherein the verifying includes testing from at least one of the tests of (a) whether the object has expected dimensions or proportions, (b) whether the corners are right angles, (c) whether a center point matches when calculated from distinct sets of the corners, (d) whether corners are generally in a common plane, and (e) whether the object lies within an expected viewing range (Figures 9-19; Column 6, Lines 23-32; Column 6, Lines 50-67; Column 9, Lines 20-25; Column 11, Lines 23-35; Column 15, Lines 30-67, Column 20, Lines 1-20).

Regarding Claim 6, Kuzunuki et al further disclose the method as claimed in Claim 1 wherein the preselected object comprised of three equidistant line points and determining the projected dimensions of the three equidistant line points (Figures 9A-9D and 19; Column 9, Lines 20-25; Column 11, Lines 23-35; Column 15, Lines 30-67, Column 20, Lines 1-20).

Regarding Claim 7, Kuzunuki et al further disclose the method as defined in Claim 6 wherein the computing comprises calculating object coordinates in real space of the object point based on the projected dimensions of the three equidistant line points in the view plane and known augmented-reality display system geometric dimensions (Figures 9A-9D and 19; Column 9, Lines 20-25; Column 11, Lines 23-35; Column 15, Lines 30-67, Column 20, Lines 1-20).

With regards to Claim 13, arguments analogous to those presented for Claim 1 are applicable to Claim 13. A piece of paper has been utilized as the real item as depicted in Figure 3A.

With regards to Claim 14, arguments analogous to those presented for Claim 2 are applicable to Claim 14.

Regarding Claim 16, arguments analogous to those presented for Claim 5 are applicable to Claim 16.

7.   Claims 8-12, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuzunuki et al (U.S. 6,266,057) in view of Wilson et al (U.S. 6,278,479).

Regarding Claim 8, arguments analogous to those presented for Claim 1 are applicable to Claim 8.

Kuzunuki et al do not explicitly disclose unprojecting the dimensional representation to calculate a plurality of object coordinates representative of a size of the object and a distance of the object from the viewing plane.

Wilson et al disclose a dual reality system comprising calculating a plurality of object coordinates representative of a size of the object and a distance of the object from the viewing plane by unprojecting the dimensional representation of the object in the viewing plane (Figures 3-15; Column 7, Lines 45-67, Column 8, Lines 1-43).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Kuzunuki et al invention according to the teachings of Wilson et al to calculate a plurality of object coordinates representative of a size of the

object and a distance of the object from the viewing plane by unprojecting the dimensional representation of the object in the viewing plane because it will provide enhanced visualization of an augmented reality system comprising of a computer generated image superimposed with a real image.

Regarding Claims 9 and 10, arguments analogous to those presented for Claim 6 are applicable to Claims 9 and 10.

Regarding Claim 11, arguments analogous to those presented for Claim 7 are applicable to Claim 11.

Regarding Claim 12, arguments analogous to those presented for Claim 5 are applicable to Claim 12.

Regarding Claim 15, Kuzunuki et al do not explicitly disclose the system as defined in Claim 14, wherein the controller includes means for computing three dimensional object coordinates of the piece of paper relative to the view plane.

Wilson et al further disclose a dual-reality system comprising means for computing three dimensional object coordinates relative to the view plane (Figures 3 and 10-15; Column 7, Lines 45-67, Column 8, Lines 1-43).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Kuzunuki et al invention according to the teachings of Wilson et al to compute three dimensional object coordinates relative to the view plane because it is the most fundamental and straight forward method for determining three dimensional coordinates of a two-dimensional geometric shapes such as sheet of papers relative to a viewing point outside the object plane.

Regarding Claim 17, Wilson et al further disclose the method defined in Claim 8 wherein the unprojecting comprises unprojecting a plurality of dimensional representation of the object attribute to movement of the object in the variable viewing area (Figures 3 and 10-15; Column 7, Lines 45-67, Column 8, Lines 1-43).

Other prior art cited

8.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Communications on ACM to Wellner is cited for interacting paper on the digital desk.

Communications on ACM to Mackay et al is cited for augmenting reality: adding computational dimension to paper.

A proceeding of UIST'91, ACM to Wellner is cited for the digital desk calculator: tangible manipulation on a desk top display.

Contact Information

9.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438.

The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular and for After Final communications.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the Technology Center Customer Service Office

whose telephone number is (703) 306-0377.

MEHRDAD DASTOURI
PRIMARY EXAMINER

Mehrdad Dastouri
Primary Examiner
Group Art Unit 2623
September 24, 2003